

EXTENSION PIECE FOR A DENTAL IMPLANT, TRANSFER AID FOR
TRANSFERRING THE POSITION OF AN IMPLANT AND OF AN EXTENSION PIECE,
AND METHOD FOR PRODUCING A BASIS FOR A RETENTION ELEMENT

On page 1, before the first paragraph insert:

RELATED APPLICATIONS

This application claims benefit of priority under 35 U.S.C. § 119 to European Patent Application 03 100 245.5, filed February 5, 2003.

FIELD OF THE INVENTION

On page 1, replace the first paragraph with the following:

The invention relates to one or more of an extension piece for a dental implant, a transfer aid for transferring the position of a dental implant and of an extension piece to a working model, and a method for producing a basis for a retention element and for taking an impression of the radial and axial position of a dental implant with an extension piece, ~~having the features of the preamble of the independent claims.~~

On page 1, insert before the second paragraph:

BACKGROUND OF THE INVENTION

On page 4, insert before the first paragraph:

SUMMARY OF THE INVENTION

On page 4, replace the first paragraph with the following:

~~It is therefore an object of the present invention to avoid the disadvantages of the prior art, in particular~~ In accordance with one or more implementations of the invention, an apparatus and/or method are provided to create an extension piece for a dental implant, which extension piece permits a parallel direction of application of a tooth replacement to be secured on the extension piece, even when the implants fitted are not parallel to one another. ~~A further object of the invention is to make available~~ Also provided are a transfer aid and a method by which the position of the implant and of the extension piece in a patient's mouth can be transferred reliably, in a simple manner, to a working model. In select implementations, [[T]]the impression-taking method and the impression-taking system and the extension piece should be simple to use and as inexpensive as possible to produce.

On page 4, replace the second paragraph with:

According to one or more implementations of the invention, these objects are achieved with there is provided an extension piece, a transfer aid and a method having the features set out in the defining part of the independent patent claims.

On page 4 line 21 to page 5 line 13, replace the paragraph with the following:

The extension piece for a dental implant according to the invention one implementation has a head part. The head part serves as a basis for a retention element. The retention element is used for securing a tooth replacement. The extension piece is additionally provided with a threaded stem, by means of which it can be screwed into the dental implant. According to the invention one implementation, the

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extension piece has at least one reference form, by means of which the position of the extension piece, seen in the circumferential direction, can be transferred to a working model. The reference form used can be any desired configuration on the extension piece permitting transfer of the position of the extension piece, as seen in the circumferential direction. The reference form can typically be a non-rotationally symmetrical reference surface. However, it can also be formed, for example, by a suitably arranged bore on the extension piece. Here, and in the following, the term reference surface is used generically to denote any conceivable type of geometric form permitting transfer of the position of the extension piece in the circumferential direction. By virtue of the at least one reference surface, the position of the extension piece in the circumferential direction can be precisely determined and transferred to the working model. For each individual extension piece, there is an exactly defined relationship between the position of the reference surface and the thread start on the threaded stem. This relationship can be transferred to the working model if the extension piece is used as transfer aid, in the manner described below. Typically, the reference surface is not rotationally symmetrical.

On page 5, lines 15 to 34, replace the second and third paragraphs with the following:

According to a preferred embodiment one or more implementations of the invention, the extension piece has a mating shoulder via which the extension piece can be supported on a shoulder of the implant. Because of the contact between mating shoulder and implant shoulder, the position of the extension piece can be precisely

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defined in the axial direction, since it is not defined, as in EP 879 024 for example, by contact between two steep cone surfaces. The circumferential position is referenced by the reference surface, the axial position by the contact of the shoulder.

According to ~~a further preferred embodiment~~ one or more implementations, the extension piece transfer contour has a first contour onto which a complementarily shaped second contour can be clamped and/or snapped. With this transfer aid, the position of the extension piece in the impression compound can be more precisely defined and retained, as is described below, while the impression is being taken.

On page 6, lines 13-19, replace the paragraph with the following:

According to ~~a further preferred embodiment~~ one or more implementations, the extension piece additionally has a non-cylindrical outer contour with screw-in surfaces. The extension piece can easily be screwed into an implant with the aid of a tool which engages on the screw-in surfaces. In this way, it is possible to precisely control the screwing-in force in the manner described below.

On page 6 line 39 to page 7 line 21, replace the paragraph with the following:

The transfer aid according to ~~the invention~~ one or more implementations is used to transfer the position of an implant, and of an extension piece secured therein, in axial direction and in circumferential direction, to a working model. The transfer aid has a transfer form designed to complement a reference form on an extension piece. The transfer form used can be any desired configuration which permits a definition of the position of the transfer aid in the circumferential direction. The transfer form can

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typically be designed as a reference surface cut out from a cylinder surface. However, other forms are also conceivable, for example projections or depressions on the transfer aid. Here, and in the description below, the term transfer surface is used as a generic designation for any configuration which permits referencing in the circumferential direction. The transfer surface can therefore also be part of a partially rotationally symmetrical form, for example, formed by a polygon. For reasons of clarity, however, preference is given to non-rotationally symmetrical surfaces which can be made congruent only in one position.

On page 7 lines 23 to 37, replace the paragraph with the following:

The transfer aid according to the invention one or more implementations has a base plate in which the transfer surface is arranged. The transfer aid is also provided with clamping and/or snap-fit means, by means of which it can be secured on the extension piece. The base plate has a form which can be anchored in an impression compound. The form should be chosen such that rotation of the transfer aid in the impression compound is prevented. The base plate can typically have a non-rotationally symmetrical outer contour and/or can be provided with holes through which the impression compound can pass and which likewise prevent rotation of the transfer aid. To prevent aspiration during application of the impression aid onto the extension piece, the impression aid can be secured with a thread.

On page 8 lines 18-26, replace the paragraph with the following:

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The clamping and/or snap-fit means of the transfer aid according to ~~the invention~~ one or more implementations can particularly preferably be formed by a circular lip which is arranged on the base plate and which has a second contour, in particular a bead, which is designed to complement a first contour, especially designed as a groove, of the extension piece and can be snapped and/or clamped onto it. Of course, it is also possible to provide a groove on the transfer aid, and a bead on the extension piece.

On page 9, line 11 to page 10 line 20, replace the paragraph with the following:

A further aspect of one or more implementations ~~the present invention~~ lies in the use of an extension piece which can be machined, in particular ground, for a dental implant, as a transfer part for transferring its position on a dental implant in the axial and circumferential directions, and as a basis for a retention element. ~~According to the invention, t~~he extension piece is therefore used not for only as a basis for a retention element, but also transferring its own position in a firmly screwed state on the implant. In this way, it is possible to dispense with an additional transfer part, such as is described for example in EP 879 024. Sources of error are minimized. In particular, the relationship between transfer surface and thread start, which relationship is individual to each extension piece, is precisely maintained.

A further aspect of ~~the invention~~ one or more implementations lies in the combination of a transfer aid, as described above, with an extension piece, as described above. The transfer surface of the transfer aid is in this case designed complementing the reference surface of the extension piece.

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The method according to ~~the invention~~ one or more implementations serves in the first instance for taking an impression of the position, in circumferential direction and axial direction, of a dental implant implanted in a patient's jaw bone, and of an extension piece secured thereon, and transferring this to a working model. The method according to the invention additionally concerns the production of a basis, for a retention element, which can be screwed into the implant. Taking the impression of the situation in the mouth is the first step of the method.

On page 10 lines 8-20, replace the paragraph with the following:

In the method according to one or more implementations ~~the invention~~, an extension piece as basis for a retention element is firstly screwed into each implant provided for this purpose in the patient's mouth. Here, and in the text below, the method is illustrated with reference to an implant with an extension piece. Of course, the method is advantageously used in particular with several implants and/or abutments (for example a residual dentition with tooth stumps which, in addition to implants, support a basis for a retention element). The screwing is done with a predetermined first torque. In this way, it is possible to ensure that the position of the extension piece in the implant can be precisely reproduced.

On page 14, line 23, insert the following:

BRIEF DESCRIPTION OF THE DRAWINGS

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On page 14, lines 32 to 37, replace the paragraphs with the following:

Figure 2a: shows a perspective view of an extension piece according to one embodiment of the invention, seen from above,

Figure 2b: shows a perspective view of the extension piece according to one embodiment of the invention, as seen from below,

On page 15, lines 7-8, replace the paragraph with the following:

Figure 4a: shows a perspective view of a transfer aid according to one embodiment of the invention

On page 17, line 24 insert the following:

DETAILED DESCRIPTION

On page 18, lines 15-27, replace the paragraph with the following:

Figure 2a shows a perspective view of an extension piece 2 according to one embodiment of the invention. The extension piece 2 consists principally of a head part 20 and of a threaded stem 29 arranged at one end of the head part 20. For the sake of clarity, the thread of the threaded stem 29 is not shown. The head part 20 has several screw-in surfaces 21 arranged in a polygonal formation. With the screw-in surfaces 21, the extension piece 2 can be screwed tight using a suitable tool. Provided on the head part 20 there is a first contour 22 in the form of a peripheral groove. The first contour serves for engagement with a correspondingly shaped second contour 45 on a transfer aid (see Figures 4a and 4b).

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On page 19 line 32 to page 20 line 7, replace the paragraph with the following:

Figures 4a and 4b show perspective views of a transfer aid 4 according to one embodiment of the invention. The transfer aid 4 consists principally of a base plate 40 on which a circular lip 44 is arranged. An opening 41 is arranged in the base plate 40. The opening 41 serves to receive the semicircular cylinder section 23 of an extension piece 2. The opening 41 is delimited by a substantially diagonally extending transfer surface 42 and by a semicylindrical inner wall 47. Moreover, a recess 46 is additionally provided in the transition area between the semicylindrical inner surface 47 and the transfer surface 42. In the area of the transition, the recess 46 creates sufficient space to ensure that the transfer aid can be easily applied to a matching extension piece.

On page 26, line 11, insert the following:

Other embodiments of the invention will be apparent to those skilled in the art from consideration of the specification and practice of the invention disclosed herein. It is intended that the specification and examples be considered as exemplary only, with a true scope of the invention being indicated by the following claims.

On page 27, line 1, replace the heading as follows:

CLAIMS

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